



A world leader in clean fuel technology.

Washington State



Ben Franklin Transit test fleet

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O2Diesel – The Company

- Recognized Market Leader in E-Diesel
- 15 Fleets in Operation
 - Two More Fleets Signed
- Testing Data – CARB and EPA
- Strong Patent Position
- \$9.1 million in U.S. Government Appropriations
- Commercialization commenced 2005

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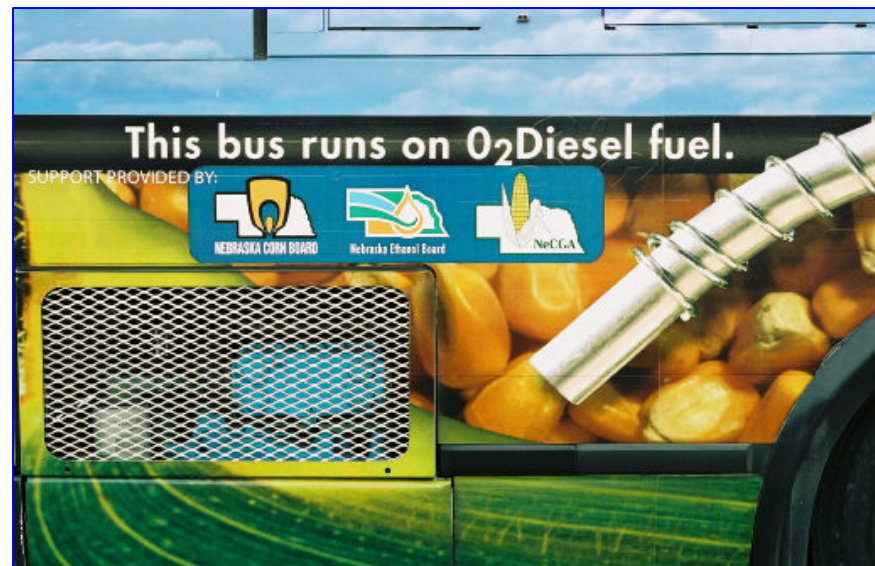
What is O₂Diesel™ ?

A Blended Diesel Fuel

- 7.7 vol% Fuel Ethanol
- 0.6 vol% Proprietary Additive
- 91.7 vol% Regular Diesel

Premium Fuel Qualities

- Enhanced Lubricity
- Added Cetane
- Improved Corrosion Resistance
- Outstanding Static Properties
- Compatible with Diesel No.1 & 2 - LSD and ULSD, CARB, TxLed, and Biodiesel
- Compatible with other fuels and technologies



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O₂
DIESEL

Why Use Ethanol in Diesel?



Petro-Diamond- Long Beach

- U.S. agricultural based renewable replacement for imported petroleum
- Outstanding exhaust emissions benefits – reduction of both NOx & PM in new & older diesel engines
- Good ethanol supply & infrastructure partners available
- Greenhouse gas reductions (See Argonne National Labs summary)

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What makes O2Diesel™ Different From Regular Diesel?

The Short Answer: *Ethanol*

- Improves combustion performance
 - Reduces exhaust emissions by
 - Slightly increases fuel volatility
 - Lowers flashpoint temperature
-
- O2Diesel™ is a Class 1 flammable fuel, and at minimum must be handled in the same manner as gasoline



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Managing E-Diesel



- Fuel is limited to use in centrally-fueled fleets.
- Fuel is handled like a Class 1 flammable material (e.g. gasoline).
- All equipment storing or using fuel are outfitted with spark arrestors.
- Spark arrestors have stringent testing protocols at independent testing facilities
- Fleet personnel are trained in the proper fuel handling & use.
- Safety protocols & procedures have been independently recommended and reviewed. (TIAX and NREL)

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Implementation Steps

- O2Diesel technical staff reviews the fleet and infrastructure.
- Fleet is outfitted with spark arrestors and booster pumps (if needed).
- Formal safety training of staff.
- Storage tanks are cleaned and the vent(s) is outfitted with a spark arrestor and water adsorbing filter.
- O2Diesel™ fuel is introduced into storage on top of any remaining diesel fuel.
- Buses/trucks/cranes are fueled as they normally would be.
- Fuel filters may need changing after a few days on O2Diesel™ fuel due to the cleaning action of the fuel.
- O2Diesel™ fuel is completely interchangeable with your regular diesel fuel.



Fuel Side Spark Arrestor

Fuel Booster Pump



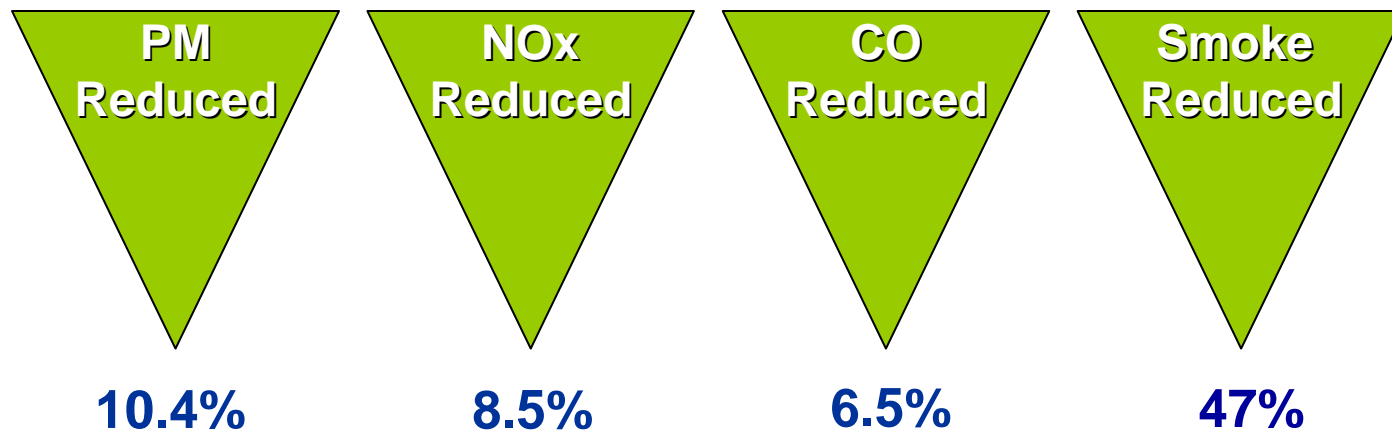
Vent Side Spark Arrestor



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ULSD/O₂Diesel™ Emission Reductions

O₂Diesel™ Prepared from ULSD



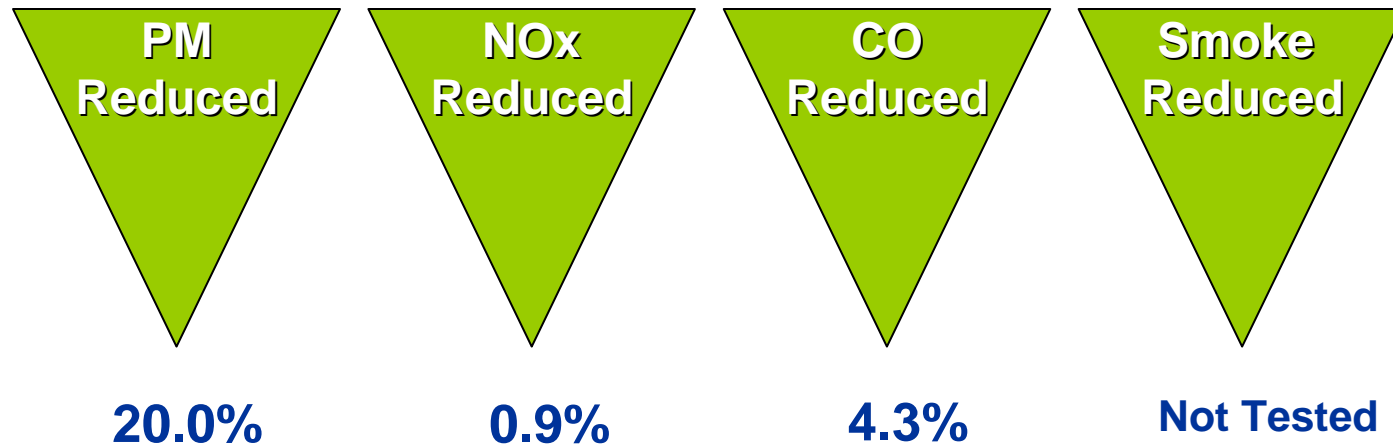
- Cummins ISB Engine
- O₂Diesel™ Prepared from ULSD compared to No. 2 Diesel
- 1000 Hours Durability – Performance Equal to No. 2 Diesel
- Data: Allion Science & Technology and Ricardo Inc. Nov. 2005



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O2Diesel prepared from Carb/ULSD Emission Reduction

O₂Diesel™ Prepared from CARB ULSD



- Data Comparing O₂Diesel™ to CARB ULSD
- 1st Quarter 2007 data from SwRI test
- Detroit Diesel Series 60
- O₂Diesel™ Prepared from CARB ULSD

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Emission Reductions of Biodiesel + O2Diesel™

Benefits versus Cal ULSD Base Fuel

	THC	CO	NOx	PM
Baseline (g/hp-hr)	(-0.08)	(-2.2)	(4.6)	(0.19)
O2Diesel	31.6	-4.3	-0.9	-20.0
O2Diesel + B5	26.2	-5.4	-2.4	-19.5
O2Diesel + B12.3	36.4	-5.7	0.6	-31.1

- Test performed at SwRI- Results were the average of 3 – hot starts Transient Test Cycle
- Percent Emissions Reduction (-)/Increase (+)

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O2Diesel™ Improves Emission Reduction of Diesel Oxidation Catalyst

Summary of Percent Change in Average Emissions with Exhaust After-Treatment Devices on '98 Cummins M-11 and '91 Detroit Series 60

	THC	CO	NOx	PM
Test Method		On California ULSD		
DOC 1 with Series 60	-88.0	-58.9	2.22	-3.5
DOC 2 with M-11	-69.2	-56.6	0.3	-18.3
DOC 3 with M-11	-98.6	-99.4	-0.1	-36.5
		On O2Diesel™		
DOC 1 with Series 60	-77.1	-64.8	0.7	-27.2
DOC 2 with M-11	-59.1	-65.7	-0.5	-43.8
DOC 3 with M-11	-97.8	-99.1	-3.7	-50.2

Test performed at SwRI- Results were the average of 3 – hot starts Transient Test Cycle

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O2Diesel™ – Cleaner Air Urban Centers

Diesel engine emissions are targeted by federal and state governments for major reductions because:

- Ozone non-attainment –large urban areas where ozone levels exceed Federal Standards must reduce mobile source emissions of ozone-forming oxides of nitrogen (NOx)
- Particulate matter – a diesel-related toxic air contaminant that contributes to heart disease, lung cancer and childhood asthma
- Carbon monoxide – a poisonous gas emitted by internal combustion engines and is harmful to human health

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O2Diesel™ Features

- Compatible with all Base Diesel Fuels: Premium with enhanced operability for ULSD, #1 Diesel, #2 Diesel, on and off-road, and Biodiesel.
- Lubricity enhancement: Increases lubricity by up to 40%.
- Improved conductivity: Quickly dissipates static electricity.
- Enhanced cetane: Equal to or exceeds that of base fuel.
- Distribution system cleanliness: Trouble free operations due to complete and permanent cleaning of fuel-system.
- Blends with all other diesel fuels: Vehicle can fill with regular diesel if operating out of area, avoiding “range” restrictions. Fungible.
- Stable in variety of climates: Proven and cold and hot weather stability and operability.

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O2Diesel™ Features

- No environmental side effects. EPA Tier I Testing at SWRI.
- Maintains engine performance. No Measurable Torque or Horsepower Loss (see following chart).
- Maintains fuel economy. MPG between O2Diesel and base fuel within repeatability of test measurement.
- Easily blended. O2Diesel™ is blended at fuel terminals and delivered to customers' existing storage tank or by mobile refueling.
- Documented engine durability.
 - 1000 hr 13 Mode European Stationary Cycle Test on Cummins ISB Engine at Ricardo.
 - 140 Units at Long Beach have Logged one half million hours on O2Diesel™, 20 months with no negative impact.

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Long Beach Container Terminal- Vehicle Profile

99 Total Vehicles – 533,520 Total Hours

Manufacturer	Model	Year	# of Units	Tot Hrs/Class	DOC
Cummins	6BTA 5.9	2001	29	5520	Yes
Cummins	6BTA 5.9	2003	30	5520	Yes
Cummins	6CTA	1998	4	5520	Yes
Cummins	ISB	2005	22	4800	Yes
Cummins	K19	2001	6	7360	Yes
Cummins	LTA10	1992	2	5520	Yes
Komatsu	21 Litre	2005	6	4160	Yes

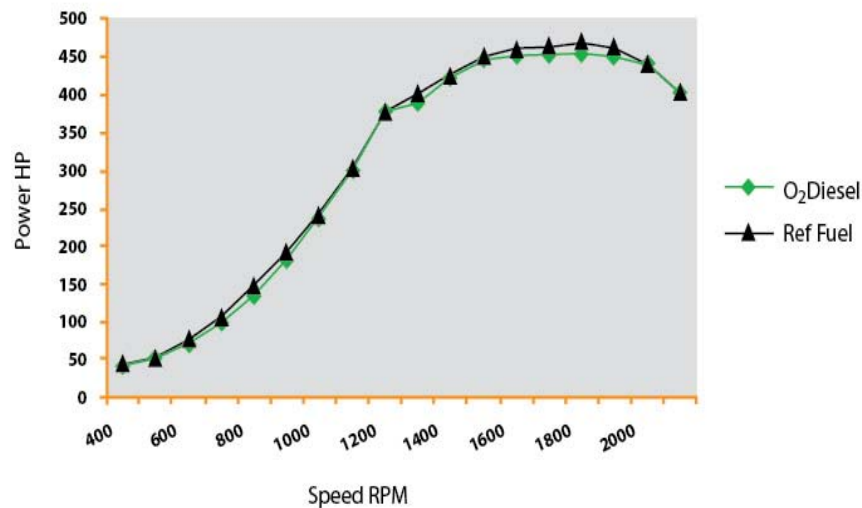
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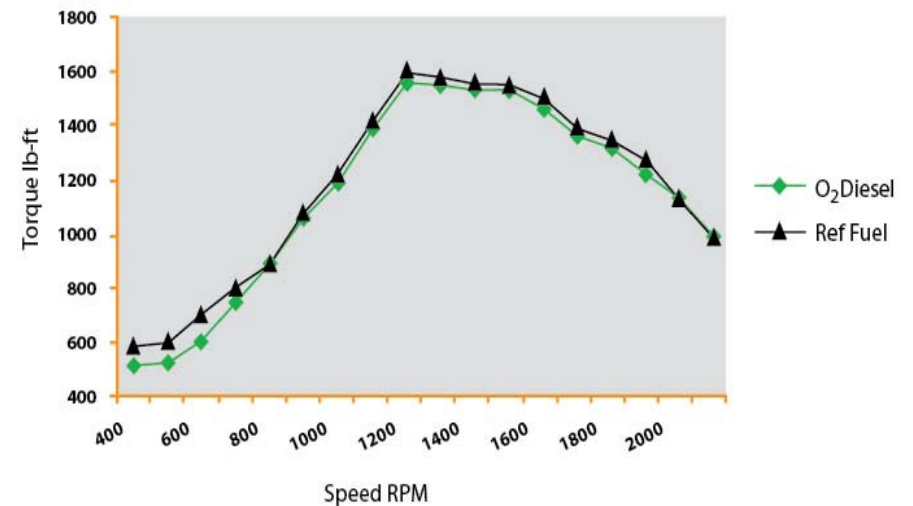
O2Diesel - Maintains Engine Performance

1991 DDC Series 60 Power and Torque Maps

Power vs. RPM



Engine Torque vs. Speed



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O2Diesel - Key milestones for O2Diesel™ verification & recognition

- Environmental Protection Agency – Tier 1 Health Effects Testing
- U.S. Environmental Protection Agency – Emissions Technology Verification (pending)
- California Air Resources Board – Alternative Diesel Fuel Status and Interim Certification of Emissions
- California Air Resources Board Letter
- Nevada Department of Environmental Protection – Alternative Diesel Fuel Status

(All documents available upon request)

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CityHome™ Marketing Program

- O2Diesel™ fuel will be sold to transits/school systems at the same cost as their standard diesel fuel.
- Sponsor contributions are used to offset the cost of the fuel.
- Jobbers are reimbursed by O2Diesel.
- Each school provides media space to CityHome
- Sponsors will gain visibility by their brand being associated with providing clean fuel and clean air for the school buses.
- **The goal is to co-brand the sponsor logo with the CityHome logo and associate the sponsor with a community Clean Air program----at no additional fuel costs to the school.**

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CityHome™ Current Status



Cities: Seven Cities

Schools: Three School Systems

Support: 14 sponsor partners

Campaign: Wrapped buses, radio, television, national newspaper

Recognition: Keep America Beautiful Certificate of Merit & Toyota Presidents Award

Communication: Wrist band & education program

Targeted CityHome™ Participants include:

- Bus fleets
- School buses
- Transportation fleets

CityHome Partners



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Campaign Example- Public Transportation

Wrapped Buses

Radio Commercial

TV Commercial

Local Press

Financial Times

**Keep America
Beautiful Award**



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Campaign Example- School Bus Program

Leveraging Sponsorship for the program:

- Use the media space from Partners (City bus ads, Radio, TV, etc.)
- Posters
- Academic program
- School - family PTA program
- Bill boards
- Press conference
- Wristband promotion

All marketing activities subject to School approval.



Chicago Public Schools Bus Stop

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Use of O2Diesel™ Allows Washington State to address:

Public Needs

- By providing a cleaner fuel that is verified by the California Air Resource Board interim verification procedure
- By reducing green house gases through the use of a renewable fuel
- By providing a methodology to match private funds with public needs

Health Benefits

- By reducing NOx, CO and Particulate Matter contributing to respiratory illness, cancer and premature deaths

Operational Needs

- By providing a fuel proven to work effectively in the Port of Long Beach over the last two years

Economic Realities

- By providing a solution that requires little infrastructure investment and a modest incremental price-approximately \$.10/gallon over existing ULSD